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ABSTRACT

A general framework for developing a graduate profile based on academic status is presented. It is the result of a study conducted at Tidewater Community College to examine a methodology for determining general profiles of occupational/technical and transfer graduates. A 24-item questionnaire was mailed to all 1977 graduates, from which 461 usable data records were obtained, representing a 59 percent response. A discriminant analysis procedure was used to identify distinguishing descriptors between the two graduate groups. The resulting profile of graduates based on academic status increased institutional awareness of the major differences between graduates by supplying descriptive information about graduates rather than simply the numerical data normally supplied. Such profiles can assist institutions in their overall evaluation of curricula and services.
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CHARACTERISTICS OF TWO-YEAR COMMUNITY COLLEGE GRADUATES:
THE USE OF DISCRIMINANT ANALYSIS TO DIFFERENTIATE BETWEEN
TRANSFER AND OCCUPATIONAL/TECHNICAL STUDENTS

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Characteristics of Two-Year Community College Graduates: The Use of
Discriminant Analysis to Differentiate Between Transfer and Occupational/
Technical Students

ABSTRACT

The major purpose of this study was to examine specific measures with the intent of differentiating between transfer and occupational/technical graduates from a community college. A discriminant analysis procedure was used to identify distinguishing descriptors between these two graduate groups. Examination of the discriminant function provided information for the development of a general profile of graduates based on academic status. Development of the profile increased institutional awareness of the major differences between graduates by supplying descriptive information about graduates rather than simple numerical data.

Introduction

Graduate follow-up studies have almost become one of the standard products of research in the community college segment of higher education. Resulting predominantly from external factors, community colleges have instituted graduate follow-up studies primarily to satisfy both state and federal demands for graduate data (Henard, 1978). Usually, state and federal requests for graduate data are simply aggregation of numerical data, rarely requiring any data analysis or interpretation. Coordinated with funding of educational programs, federal requests are centered primarily on occupational/technical graduates and their subsequent employment activities after graduation. Graduate follow-up studies are as varied as the institutions for which they are conducted and the reporting of the obtained data is just as diverse (Dixon, Freeman, & Casto, 1978; Holderfield, 1978; Hall, T.; Williams & Snyder, 1974; Reed & Hall, 1977). The major purpose of graduate data at the community college appears to be the satisfaction of numerical data requests, the majority being external to the institution.

Compared to four-year institutions of higher education, the characteristics of community college students are exceedingly varied and are expected to diversify even more in the future (Myran, 1978). Many students enrolling at community colleges are the first in their family to do so. Similarly, older adults are also enrolling in order to acquire their first experience at the college level. Still others are attending specialty courses which may supplement a personal interest or avocation. Eligible for financial benefits, many veterans have enrolled in the community college to enhance their personal education.

In addition, many students are concerned about acquiring basic job skills before entering or reentering the labor force. Often, just a few particular courses are all the student needs or desires.

The open admissions policy, which has attracted so many to the community colleges (Cross, 1976), has resulted in a corresponding high turnover rate among students (Astin, 1975; Kesselman, 1976). However, the role of higher education is changing in that it must attempt to assist all individuals in their becoming productive in society, business and industry. Institutions of higher education will have to tailor their programs so that students will acquire the skills to succeed in both vocational and non-vocational areas (Solmon, 1975). Specifically, the community college will have to be structured, both in the areas of instruction and student services, so that its graduates can find gainful employment while integrating into society (Gleazer, 1977). Similarly, recent enrollment trends now indicate growth in the numbers of students enrolling in the traditional transfer-oriented curriculums offered by community colleges (Thompson, 1978; Wood & Wilson, 1975). Transfer-oriented students are attending community colleges primarily because of low tuition costs, convenience to home, the need to work to finance educational expenses, and quite possibly all of these. Usually, the transfer-oriented student is concerned with acquiring basic academic credits before transferring to a four-year institution. The increasing enrollment of both traditional students and employment-oriented students will result in greater numbers of graduates from community colleges. Therefore, it will be important that graduate follow-up studies be conducted and the data be interpreted into meaningful and evaluative information.

The analysis and interpretation of graduate follow-up data should be structured so as to provide information for such areas as academic planning, instructional evaluation, curriculum evaluation, budgeting, employment potential, student recruitment and retention, and curriculum design (Henard, 1978; Hurlock & Perry, 1975). Mortorana and Sturtz (1973) indicated that one area of graduate follow-up study that is in need of extended examination is data pertinent to occupational/technical graduates and transfer graduates. Just as both groups can be considered transfers, that is occupational/technical graduates proceed to the labor market and transfer graduates enroll at four-year institutions, further insight is needed to determine the progress of these graduates. Examination of these graduates and their preparation for their respective activity obtained from the community college, through its curricula and services, could assist institutional evaluation and planning.

The purpose of this study was to examine a methodology for the determination of general profiles of occupational/technical and transfer graduates of a community college. Certain general assumptions about occupational/technical and transfer graduates that were examined in the analyses were: 1) occupational/technical graduates enrolled with definite career goals which are related to curriculum interests; 2) occupational/technical graduates, while enrolled at the college, were employed in areas related to their curriculum; 3) occupational/technical graduates enter the labor market after graduation; 4) transfer graduates, while enrolled at the college, are similar to their counterparts at a four-year institution; 5) transfer graduates enrolled with definite career goals which are related to curriculum interests; and, 6) transfer graduates pursue their education at a four-year

institution after graduation. A review of the literature failed to reveal any studies in which similar analyses of graduate data had been performed.

Methodology

The sample data analyzed in this study were obtained from the 1977 Graduate Survey conducted by the Office of Institutional Research at Tidewater Community College. A 30 item questionnaire was mailed to all 1977 graduates, from which 461 usable data records (59 percent response) were obtained. Based on the intent of differentiating between occupational/technical and transfer graduates, twenty-four items were selected from the questionnaire for inclusion in the analyses of this study.

From examination of the curriculum to which a degree was awarded, respondents to the graduate study were classified by academic status as either an occupational/technical or transfer graduate. A series of contingency tables were constructed between academic status and all of the variables preselected from the graduate questionnaire.¹ After examining each of the contingency tables, those variables, which when analyzed across academic status produced a significant chi-square value ($\alpha < 0.001$), were retained for additional analyses. Incorporating the remaining variables, a discriminant analysis procedure was implemented to identify distinguishing descriptors between the two groups of graduates.

Results

From analysis of the data presented in the contingency tables, eleven items were considered significant for inclusion in the discriminant analysis procedures. From a SPSS discriminant analyses procedure,² a single discriminant function was determined with academic status incorporated as the criterion measure. Table 1 presents the unstandardized discriminant function coefficients obtained from the analysis of occupational/technical and transfer graduate data. Evaluation of the discriminant function with the sample data revealed that 80 percent of the respondents could be correctly classified, based on the differentiating descriptors, as either occupational/technical or transfer graduates (Table 2).

From the analyses, the following two general profiles on occupational/technical and transfer graduates were developed to substantiate the methodology. Complex data analysis and interpretation were purposely omitted, since the intent of this study was to emphasize a methodology whose data analyses could provide a variety of evaluative information about graduates.

Occupational/Technical Graduates

Occupational/technical graduates represented 72 percent of the respondents who participated in the survey. Though the majority of recipients were Caucasians, minority graduates were more likely to have received an occupational/technical degree than a transfer degree. Approximately one-fourth of these graduates were minority

TABLE 1

UNSTANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS

<u>Variables</u>		
X ₁	Race	.12091
X ₂	Marital Status	.02036
X ₃	Educational Goal	-.20280
X ₄	Career Objective	.17052
X ₅	Financial Aid	.49499
X ₆	Employed while enrolled	.27511
X ₇	Employment related to curriculum while enrolled	-.55380
X ₈	Current employment status	-.16787
X ₉	Employment related to curriculum	-.14852
X ₁₀	Current educational status	-.33661
X ₁₁	Reasons for continued education	-.08246
Constant		-.10841

Group Centroids

Occupational/ Technical	.34921
Transfer	-.92845

Chi-square value = 178.2
((df = 11, ($\alpha < .0001$)))

Wilk's lambda = 0.675

TABLE 2
PREDICTION OF GROUP MEMBERSHIP

ACTUAL GROUP MEMBERSHIP	NUMBER OF GRADUATES	PREDICTED GROUP MEMBERSHIP	
		OCCUPATIONAL/TECHNICAL	TRANSFER
Occupational/ Technical	335	271 (81%)	64 (19%)
Transfer	126	32 (75%)	94 (25%)

Percent of 'Grouped' cases correctly classified: 80%

students, which corresponds to the proportion of enrolled students at the subject community college. The majority of occupational/technical graduates were married, with less than one-third indicating they were single. Interestingly, 61 percent of the occupational/technical graduates received financial assistance while enrolled. Combined with vocationally-oriented curricula and a substantial proportion of minority graduates, occupational/technical graduates were three times as likely to have received some form of financial assistance than transfer graduates.

The majority of occupational/technical graduates indicated their initial reason for attending the subject college was either to improve employment or career skills, upgrade technical knowledge and skills in a specific field or acquire a two-year associate degree. Occupational/technical graduates were equally divided between pursuing vocationally-oriented one- and two-year curricula. The majority of occupational/technical graduates indicated they had decided their career goals as a result of employment experiences. Also, approximately one-fifth of the occupational/technical graduates determined their career objectives while enrolled in high school. Only a small proportion of occupational/technical graduates identified their career objectives while enrolled at the subject college, thus reinforcing the assumption that occupational/technical graduates enroll with predetermined goals in mind; that is, they had enrolled in order to acquire certain skills necessary to satisfy specific employment needs. Overall, occupational/technical graduates appeared to have been less exploratory in regards to curricula than transfer graduates.

Comparatively, a large proportion of occupational/transfer

graduates (40 percent) indicated that they had continued their educational pursuits after graduating from the subject community college. Approximately 41 percent of those occupational/technical graduates still participating in educational programs had reenrolled at the subject college. In addition, a large proportion of occupational/technical graduates were attending a four-year institution. Overwhelmingly, the majority of occupational/technical graduates who were engaged in additional educational pursuits indicated their reason was to prepare for further job opportunities in the present occupation, to improve their present skills and abilities, or to prepare for changing to another occupation. These graduates were continuing their personal development by acquiring additional vocationally-oriented education which could be transposed into better future employment possibilities. Less than 10 percent of occupational/technical graduates were continuing their educational activities for personal satisfaction and general knowledge. Contrary to the assumption that occupational/technical graduates are enrolled at the community college essentially to obtain employment skills for immediate entry into work, a substantial proportion of these graduates are continuing their education. However, reinforcing their primary goal for higher education, those occupational/technical graduates who are participating in additional educational endeavors are doing so to broaden their skills and expertise primarily for future employment.

Contrary to the assumptions that occupational/technical graduates normally enter or reenter the labor market upon completion of the degree program, approximately 16 percent of all occupational/technical graduates indicated they were enrolled at a four-year institution. The expanding number of occupational/technical graduates pursuing educational

programs at four-year institutions indicates the need for increased articulation development, especially in areas compatible for two-plus-two arrangements, such as technical-oriented, middle management degrees. The traditional belief that occupational/technical graduates enroll for just specific skills for immediate entry into the labor market seems to be in jeopardy and may need closer study.

Similar to their transfer counterparts, three out of every four occupational/technical graduates indicated that they were employed while enrolled at the subject community college. Interestingly, over fifty percent of all occupational/technical graduates were employed full-time. Slightly less than a fourth of all occupational/technical graduates were not employed while pursuing their educational goal at the college. The changing trend of a higher proportion of occupational/technical graduates who combined employment and educational activities indicates future potential problems for such areas as course scheduling, counseling, learning resources, and administrative and student services. Because of the vocational nature of the curricula, many occupational/technical graduates might have been able to participate in cooperative education programs which would allow for both employment and educational activities.

The majority of occupational/technical graduates who were working while enrolled at the subject college were employed in a field related to their curriculum major. Approximately 80 percent of the employed occupational/technical graduates were participating in some activity related to their educational studies. Possibly, many of the occupational/technical graduates were already involved in a particular employment area before enrolling, which may have been one of the major reasons for

attending the college so as to acquire additional benefits from the acquisition of new skills and training.

Parallel to the assumption that transfers continue their education, the majority of occupational/technical graduates acquired or reentered employment after graduating from the college. Approximately 86 percent of the occupational/technical graduates were employed, of which 79 percent were full-time and 7 percent were part-time. As anticipated, the majority of occupational/technical graduates who received employment were engaged full-time. The small proportion of occupational/technical graduates not employed were equally divided between those continuing their education and those unemployed but seeking.

Correspondingly, the majority (86 percent) of occupational/technical graduates were employed in fields related to their major curriculum at the community college, reinforcing the assumption that occupational/technical graduates did enroll with definite employment goals. Only 14 percent of the occupational/technical graduates were employed in fields not related to the curriculum in which they graduated.

Transfer Graduates

From the sample data, 28 percent of the respondents were classified as transfer graduates. Overall, transfer graduates were predominantly Caucasians, significantly disproportional from the composition of the student enrollment at the subject community college. Only 6 percent of the respondents who received a transfer degree classified themselves as minority students. In regard to marital status, the majority of transfer graduates were single while enrolled at the college. However,

a substantial proportion of the transfer graduates (47 percent) indicated they were married. Only slightly over one-third of the transfer graduates received some form of financial aid, while overwhelmingly the majority (61 percent) did not. Contrary to occupational/technical graduates, it appeared that transfer graduates supported their educational expenses while attending the college.

Overwhelmingly, transfer graduates (75 percent) indicated their initial reason for enrolling was to acquire a two-year associate degree. A very high proportion of transfer students were committed to the acquisition of a four-year degree. Less than one-fourth of transfer graduates had predetermined their career goals during high school and undoubtedly structured their academic endeavors at the college to support it. However, approximately one-third of the transfer graduates determined their career goals during their tenure at the college. Interestingly, 30 percent of the transfers indicated that work experience was a major influence in their selection of career goals. Overall, it appeared that the majority of transfer graduates were defining and evaluating their career goals while enrolled, either by evaluating their choice through academic endeavors or external employment activity.

Supporting another *a priori* assumption, the majority of transfers indicated they had enrolled at a four-year institution after graduating from the subject community college. Approximately one-fifth of the transfers, however, were not presently continuing their educational pursuits. This proportion of transfers who were not actively engaged in educational activities corresponded to the proportion of transfers who indicated their initial reason for enrolling at the college was to pursue activities other than educational ones. Less than 10 percent

of the transfer graduates continuing their education were enrolled at the subject community college or specialty institutions. Possibly, those transfers still enrolled at the community college are there to acquire additional courses or another degree which will assist them later at a four-year institution or to finalize career goals. The traditional assumption that transfer graduates enroll with the intent of transferring appeared to be consistent with the majority but a substantial proportion of these graduates had enrolled with different intentions.

Transfers indicated their continuance in higher education was primarily for personal development and to prepare for future employment opportunities. A small proportion of transfers had continued their education to improve their present job skills or change occupations; however, the lack of related work experience would have limited transfers from evaluating employment with educational activity.

Unlike their counterparts at four-year institutions and similar to occupational/technical graduates, the majority of transfer graduates were employed while attending the subject community college. Approximately 76 percent of transfers were engaged in some type of employment, with one-third employed full-time and 42 percent employed part-time. Of transfers employed while attending the subject community college, the majority indicated they were working in areas unrelated to their major curriculum. Less than one-third indicated their employment activities were related to their curriculum. Probably, the need to work to finance their education, and the lack of employment opportunities without completion of a degree or further studies, hindered transfer graduates from engaging in related employment activities while enrolled

at the college. Traditionally, one would characterize transfer graduates, while at the college, as young, family supported, and attending full-time. The high proportion of transfers employed while enrolled hints at the need for some financial assistance but either the difficulties and limitations or personal pride restrict its usage.

Interestingly, the majority of transfer graduates were employed after graduating from the college. Approximately 40 percent were employed full-time, with an additional 18 percent employed part-time. For those currently employed, slightly over half of the transfer graduates indicated they were working in areas unrelated to their curriculum completed at the college. However, 45 percent did indicate that they were engaged in a field of work related to their curriculum. For those who continued their education, employment was interpreted as a means of financing the costs of additional schooling rather than acquiring work-related experience. Based on this limited information, the employment activities of transfer graduates both during enrollment at the college and after graduation, indicate the need for further and more detailed study.

Discussion

Accountability in higher education has been emphasized for many years, and with the current environment, undoubtedly will remain prominent for many years to come. The responsibilities of higher education within our ever-changing society necessitate that institutions of learning be continually responsive and adaptive. Evaluation is essential if

institutions of higher education are to provide programs and services which are adequate for the needs of their present and future students. Graduate follow-up studies are just one area from which institutions of higher education can obtain valuable information for the purposes of evaluating, planning and budgeting for curricula, staffing and facilities (Henard, 1978). Because of their relationship with a specific geographic region, community colleges have a greater need for analytical graduate follow-up studies, particularly since their image within the community has a direct effect on enrollment.

From the analysis of graduate data, this study was able to identify significant differences between certain pre- and post-graduation measures of graduates classified by academic status. The development of general profiles for occupational/technical and transfer graduates was accomplished from the data analyses. Several *a priori* assumptions about occupational/technical and transfer graduates were examined in the study, of which some were substantiated, some partially substantiated and some were rejected. Importantly, the development of the general narrative profiles provided evaluative information, not just numerical data, concerning recent graduates of the subject community college. Based on the methodology performed in this study, the inclusion of additional data elements in the graduate questionnaire would allow for the possible development of a more extensive profile of occupational/technical and transfer graduates.

The results of this study support the development of such graduate profiles, particularly in light of the information that can be derived. Rather than being examined as a group, separation of graduates into meaningful subgroups allows for the determination of information that

could support a variety of activities. With appropriate data, the ease at which general graduate profiles can be produced only reinforces the need for data analysis and interpretation of this type to produce meaningful information. The methodology described in this study can be modified to allow for the development of general graduate profiles on the basis of any criterion measure, such as sex, race, age or a combination of measures.

Development of graduate profiles periodically could assist an institution in its overall evaluation of its curricula and services. Essentially, such information would inform an institution what its graduates are doing after graduation and how well they were prepared for that activity. With a stabilizing student market, knowledge about graduates might assist in attracting new students and possibly reenrolling former students. In addition, both current and prospective students could find such information helpful in their personal assessment of an institution and its curricula.

In summary, this study presents a general framework for the development of a graduate profile based on academic status. The graduate profile could possibly be expanded by the incorporation of additional independent measures. The generality of the framework presented is important in that it is a format that provides information that is more readily understandable to consumers than numerical data.

Footnotes

¹Copies of the contingency tables may be obtained from the authors upon request.

²A minimizing Wilk's lambda criterion was implemented for variable inclusion.

References

- Astin, A. *Preventing Students from Dropping Out*. San Francisco: Jossey-Bass, 1975.
- Community College Graduates, July 1, 1977 to June 30, 1978*. Educational Services Division, Office of the Chancellor for Community Colleges, University of Hawaii, 1978.
- Cross, K. P. *Accent on Learning: Improving Instruction and Reshaping Curriculum*. San Francisco: Jossey-Bass, 1976.
- Dixon, S.; Freeman, A. C.; & Casto, L. T. *Follow-Up Report of the Spring 1977 Graduates of the Community College of Denver*. Research Report No. 20, Research and Development, Community College of Denver, 1977 (Also ERIC ED 160 152).
- Follow-Up Surveys of College Graduates: Procedures and Common Core of Questions for Two-Year Institutions*. Southern Regional Education Board, 1978.
- Gleazer, E. J. The Future of the Community College. *Intellect*, 1977, 106, 152-154.
- Hall, T. *From Student and Follow-Up Responses to a Statewide Supply/Demand Analysis of Educational Programs*. Texas Education Agency, Austin, Texas, 1978.
- Henard, R. E. *The Use of Surveys of Graduates (Outcome Studies) for Accountability and Academic Planning*. Presented at American Educational Research Association Annual Meeting, 1978 (Also ERIC ED 152 135).
- Holderfield, H. M. *The Implementation of a Statewide Student Follow-Up Project for the South Carolina Technical Education System*. Unpublished Report, State Board for Technical and Comprehensive Education, South Carolina, 1978.

- Hurlock, J. and Perry, P. Contributions of a Graduate Follow-Up Study to a Proposed Curriculum Revision in Nursing. *Colorado Journal of Educational Research*, 1975, 14, 21-24.
- Kesselman, J. *Stopping Out: A Guide to Leaving College and Getting Back In*. New York: M. Evans and Co., 1976.
- Mortorana, S. V. and Sturtz, A. J. The Occupational Student. In P. M. Kroell (Ed.), *New Directions for Community Colleges*, 1973, 36, 15-34.
- Myran, G. A. Antecedents: Evolution of the Community-Based College. In E. L. Tharlachar & J. F. Gollattscheck (Eds.), *New Directions for Community Colleges*, 1978, 21, 1-6.
- Nie, N. H.; Hull, C. H.; Jenkins, J. G.; Steinbrenner, K.; & Bent, D. H. *Statistical Package for the Social Sciences*. New York: McGraw-Hill, Inc., 1975.
- Post-College Activities of Virginia Community College Graduates 1974-1975 and 1975-1976*. Virginia Community College System, 1977.
- Reed, J. F. & Hall, T. *Tex-SIS Follow-Up*. Department of Occupational Education and Technology, Texas Education Agency, Austin, Texas, 1977.
- Solomon, L. C. College Contributions to Human Resource Needs. In P. Heist & J. R. Warren (Eds.), *New Directions for Institutional Research*, 1975, 7, 61-78.
- Thompson, J. W. The Growing Role of Community Colleges. *Journal of College Student Personnel*, 1978, 19, 11-14.
- Williams, W. G. & Snyder, F. A. *Follow-Up Studies of Former Occupational-Technical Students at Community Colleges*. Virginia Department of Community Colleges, 1974.

Wood, L. & Wilson, R. C. Higher Education and Human Resource:
Communications Channels and Mechanisms of Coordination. In
P. Heist & J. R. Warren (Eds.), *New Directions for Institutional
Research*, 1975, 7, 1-23.